

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 86515
CSAH NO. 42
OVER THE
MISSISSIPPI RIVER
DISTRICT 3 - WRIGHT COUNTY



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
BY
COLLINS ENGINEERS, INC.
JOB NO. 3512 (CEI 102)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 86515, Piers 1, 2, and 3, were found to be in good condition with no defects of structural significance observed. Since the previous inspection, the footing exposure and undermining has not changed at Pier3; however, some minor localized scour has developed at Piers 1 and 2. Moderate to heavy accumulations of timber debris were observed at Piers 2 and 3.

INSPECTION FINDINGS:

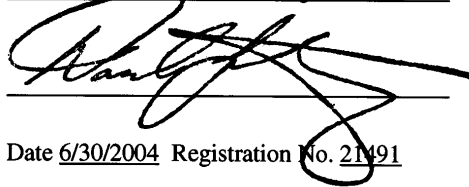
- (A) The concrete of Piers 1 through 3 was found to be in good and sound condition with random, scattered voids from poor consolidation, typically 1/2 inch in diameter with 1/4 inch of penetration.
- (B) Moderate to heavy accumulations of timber debris were observed around the upstream noses of Piers 2 and 3, respectively, and a light accumulation of timber debris was observed at the upstream nose of Pier 1.
- (C) Since the previous inspection, a 5-foot-radius by 2-foot-deep scour depression has developed at the upstream end of Pier 2. There were also 4-foot-radius by 1-foot-deep scour depressions at both the upstream and downstream ends of Pier1.
- (D) The top of the footing at Pier 3 was exposed with 5 feet of vertical face exposure at the upstream end, 4 feet along the west side, and 1 foot along the downstream end. There was also 6 inches of undermining along the upstream nose of the footing with 1 foot of probe rod penetration under the footing and no piles exposed.

RECOMMENDATIONS:

- (A) Remove the accumulation of timber debris around the piers during routine bridge maintenance.
- (B) Scour screening evaluation indicates bridge is stable for potential scour, therefore at this time, there is only a need to monitor the scour and footing exposure/undermining during future inspections.
- (C) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

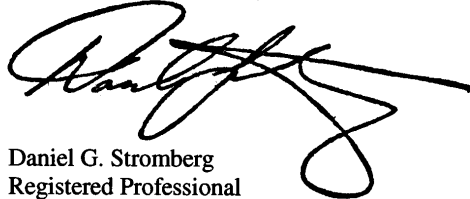
Daniel G. Stromberg

A large, stylized handwritten signature in black ink, appearing to read 'Dan G. Stromberg', is written over a horizontal line.

Date 6/30/2004 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

A large, stylized handwritten signature in black ink, appearing to read 'Dan G. Stromberg', is written over a horizontal line.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 86515

Feature Crossed: The Mississippi River

Feature Carried: CSAH No. 42

Location: District 3 - Wright County

Bridge Description: The superstructure consists of four spans of multiple concrete girders. The superstructure is supported on two reinforced concrete abutments and three reinforced concrete piers. The pier and abutment footings are supported on steel piles. The piers are numbered 1 through 3 from south to north across the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Shirley M. Walker, P.E.

Dive Team: Michelle D. Koerbel, Clayton G. Brookins

Date: September 24, 2002

Weather Conditions: Partly Cloudy, " 60E F

Underwater Visibility: " 3.0 Feet

Waterway Velocity: " 2.5 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1, 2, and 3

General Shape: The piers consist of two octagonal, eight-sided columns, one on each end of a rectangular pile supported footing, supporting a hammer head cap, with a connecting diaphragm wall between the lower half of the columns.

Maximum Water Depth at Substructure Inspected: Approximately 17.7 Feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the upstream end of Pier 3.

Water Surface: The waterline was approximately 23.0 feet below reference.
Waterline Elevation = 851.0.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 8

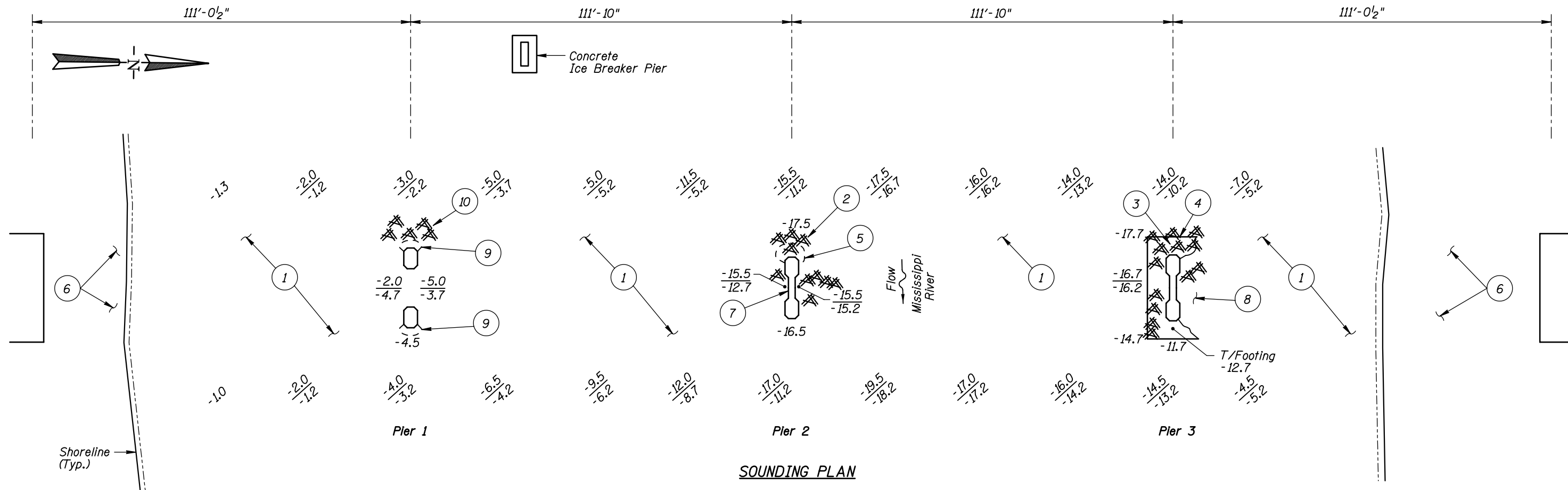
Item 61: Channel and Channel Protection: Code 6

Item 92B: Underwater Inspection: Code B/09/02

Item 113: Scour Critical Bridges: Code I/92

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

_____ Yes X No



INSPECTION NOTES:

- 1 The channel bottom material consisted of sand, gravel and scattered cobbles, 1-foot-diameter and smaller, with up to 1 foot of probe rod penetration.
- 2 A moderate accumulation of 10-inch-diameter and smaller timber debris was observed around the upstream nose extending along the north face from 12 feet below the waterline to the channel bottom.
- 3 A heavy accumulation of 2-foot-diameter and smaller timber debris was observed at the upstream end of the pier extending from the channel bottom to the waterline.
- 4 The top of the footing was exposed with 5 feet of vertical face exposure at the upstream end, 4 feet along the west side, and 1 foot along the downstream end. There was also 6 inches of undermining along the upstream nose of the footing with 1 foot of probe rod penetration under the footing and with no piles exposed.
- 5 A 5-foot-radius, 2-foot-deep scour pocket was observed at the upstream nose of the pier.
- 6 The embankments consisted of 1- to 2-foot-diameter riprap.
- 7 A horizontal steel H-pile strut was observed 10 feet below the waterline and protruded 4 inches from each side of the web wall. There was no associated spalling present.
- 8 Sand infilling with cobbles was observed along the east face of the pier.

- 9 A 4-foot-radius, 1-foot-deep scour pocket was observed at the upstream and downstream ends of the pier.
- 10 A light accumulation of 10-inch-diameter and smaller timber debris was observed at the upstream end of the pier.

GENERAL NOTES:

1. Piers 1, 2, and 3 were inspected underwater.
2. At the time of inspection on September 24, 2002, the waterline was located approximately 23.0 feet below the top of the cap at the upstream end of Pier 3. This corresponds to a waterline elevation of 851.0 based on the previous report dated September 12, 1997.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

TYPICAL END VIEW OF PIERS

Legend

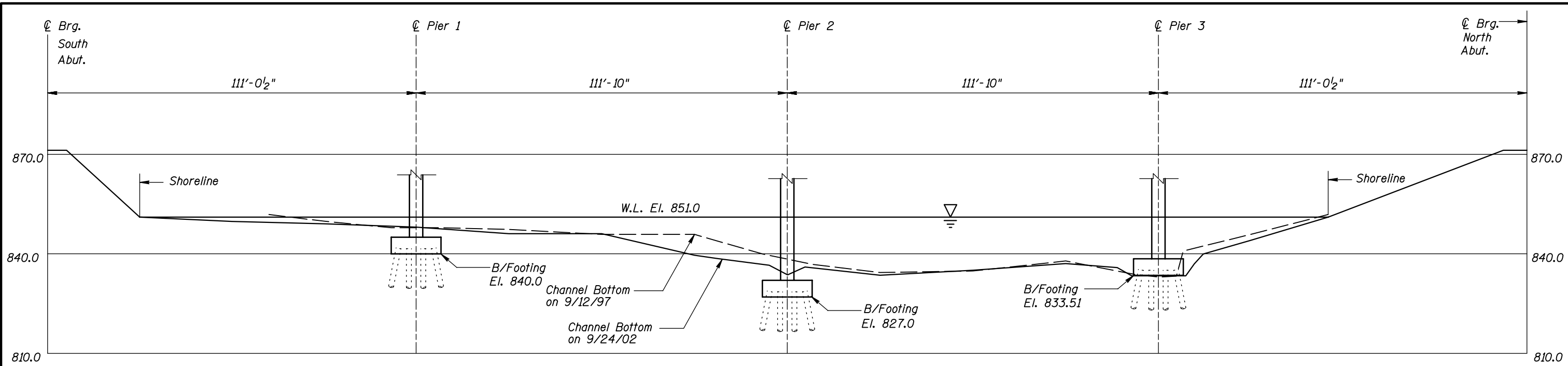
- 2.0 Sounding Depth from Waterline (9/24/02)
- 5.2 Sounding Depth from Waterline (9/12/97)
- Timber Debris
- Scour Depression

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION

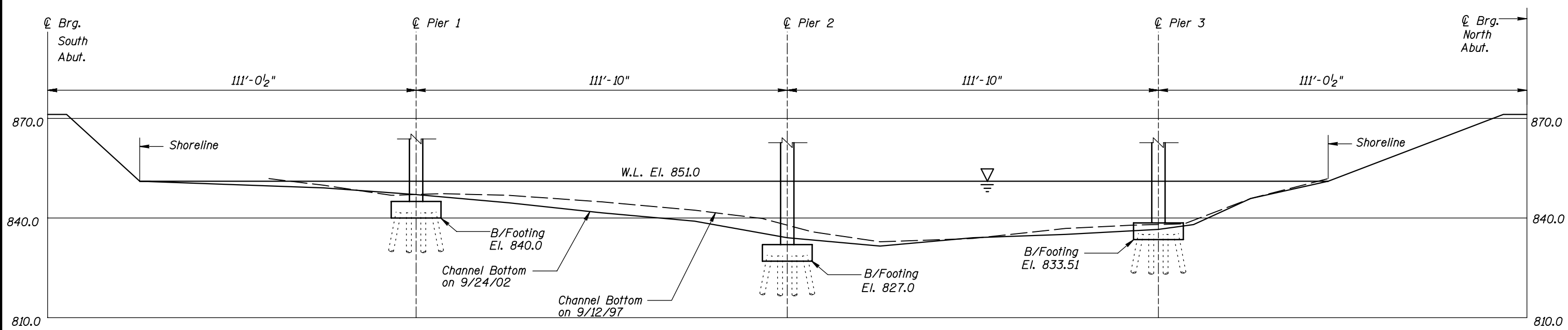
STRUCTURE NO. 86515
OVER THE MISSISSIPPI RIVER
DISTRICT 3, WRIGHT COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: SEPT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 35120102		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 86515 OVER THE MISSISSIPPI RIVER DISTRICT 3, WRIGHT COUNTY UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: PRH Checked By: MDK Code: 35120102	COLLINS ENGINEERS, INC. 300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Date: SEPT. 2002 Scale: 1"=30' Figure No.: 2



Photograph 1. Overall View of the Structure, Looking West.



Photograph 2. View of Pier 1, Looking North.



Photograph 3. View of Pier 2, Looking South.



Photograph 4. View of Pier 3, Looking South.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: September 24, 2002

ON-SITE TEAM LEADER: Shirley M. Walker, P.E.

BRIDGE NO: 86515 WEATHER: Sunny, 60EF

WATERWAY CROSSED: Mississippi River

DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
OTHER

PERSONNEL: Clayton M. Brookins, Michelle D. Koerbel

EQUIPMENT: Scuba, U/W Light, Scraper, Sounding Pole, Lead Line, Probe Rod, Camera

TIME IN WATER: 3:40 P.M.

TIME OUT OF WATER: 4:40 P.M.

WATERWAY DATA: VELOCITY " 2.5 f.p.s.

VISIBILITY " 3.0 foot

DEPTH 17.7 feet maximum at Pier 3.

ELEMENTS INSPECTED: Piers 1, 2, and 3

REMARKS: Overall, the concrete of the piers and the exposed footing (Pier 3) was in good and sound condition with no structurally significant defects observed. The footing exposure at Pier 3 had a maximum vertical face exposure of 5 feet (full height), and 6 inches of undermining at the upstream nose with 1 foot of penetration under the footing (no piles exposed). Moderate to heavy accumulations of timber debris were observed at the upstream ends of Piers 2 and 3, and Pier 1 exhibited only a light amount of timber debris. The channel bottom overall appeared to be firm and in stable condition, but minor localized scour pockets have developed at Piers 1 and 2 since the previous inspection.

FURTHER ACTION NEEDED: _____ YES ____X____ NO

Remove the accumulation of timber debris around the piers during routine bridge maintenance.

Scour screening evaluation indicates bridge is stable for scour potential, therefore, monitor scour and footing exposure/undermining during future inspections.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 86515
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Shirley M. Walker, P.E.
WATERWAY CROSSED The Mississippi River

INSPECTION DATE September 24, 2002

NOTE: USE ALL APPLICABLE CONDITION
DEFINITIONS AS DEFINED IN THE MINNESOTA
RECORDING AND CODING GUIDE INCLUDING
GENERAL, SUBSTRUCTURE, CHANNEL AND
PROTECTION, AND CULVERTS AND WALL
DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	SUBSTRUCTURE						CHANNEL					GENERAL					
			PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	5.0'	N	8	N	9	N	8	7	N	N	7	7	8	N	N	N	N	N
	Pier 2	17.5'	N	8	N	9	N	8	6	N	N	6	6	8	N	N	N	N	N
	Pier 3	17.7'	N	8	7	9	N	7	5	N	N	6	5	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete of the piers and the exposed footing (Pier 3) was in good and sound condition with no structurally significant defects observed. The footing exposure at Pier 3 had a maximum vertical face exposure of 5 feet (full height), and 6 inches of undermining at the upstream nose with 1 foot of penetration under the footing (no piles exposed). Moderate to heavy accumulations of timber debris were observed at the upstream ends of Piers 2 and 3, and Pier 1 exhibited only a light amount of timber debris. The channel bottom overall appeared to be firm and in stable condition, but minor localized scour pockets have developed at Piers 1 and 2 since the previous inspection.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.